

SCOPUS

THE MARABOU IN KENYA

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It is hard to believe that Jackson (1938) could write, when he recorded Marabous *Leptoptilos crumeniferus* from the Lower Tana River, that this was the "... only instance of its ranging east of the Rift Valley". And that Marabous were "... not often seen on the ground..". The comment by Brown et al. (1982): "Frequent to common in most of range, locally abundant ..." seems more familiar. There is no doubt that the species has increased greatly during the present century, and by 1984 had been widely recorded in Kenya, except for the arid north and east where it is still very uncommon (Lewis & Pomeroy in press). The main purpose of this paper is to review the species' present status in Kenya, and particularly its breeding.

Following studies of Marabous in Uganda (e.g. Pomeroy 1973), I was interested to compare the situations in the two countries. There are striking differences. The Marabou, despite being widespread in Kenya, is much less numerous than in Uganda, where very large congregations may occur (that is to say, several hundred birds together). In Uganda, there are some 15-20 breeding colonies (Pomeroy 1977a), compared to only 5 or 6 in Kenya.

SOURCES OF DATA

Between 1974 and 1982 I followed up all reports of Marabou breeding colonies in Kenya, through the literature and by requests for information. The results were rather disappointing. There could still be undiscovered colonies but they are likely to be small, since most of Kenya is crossed quite frequently by light aircraft and colonies are conspicuous from the air. Further, pilots are likely to report them since the Marabou, like vultures, is a recognized hazard to light aircraft.

In addition, I made observations annually from 1977 to 1982 on the colonies at Kiboko and Kibwezi, and in several years at Kitale. Marabou colonies take 6-8 months from nest-building to fledging, and as nest-building is mainly between June and October, fledging is in

the next calendar year. Unless otherwise indicated, years refer to nest building and egg laying. Records of Marabous away from breeding colonies were not made systematically.

BREEDING COLONIES

Of the ten colonies which have been reported for Kenya, two are in urban areas and three others adjacent to a town or village; in Uganda, six out of the 27 recorded are in or near a town or village (Pomeroy 1977a). The numbers of nests recorded at nine of the colonies are given in Table 1. The main features of each colony are as follows; they are numbered in the Table.

1. Kitale. The colony is scattered in acacia trees (probably *Acacia abyssinica*) on the north-western outskirts of the town. Some of the trees are also used by Black-headed Herons *Ardea melanocephala*. Most of the trees are in or adjacent to the municipal rubbish dump, a regular feeding place for Marabous. The colony was studied in detail by Kahl (1966).

2. Garissa. Of the two records in Table 1, North's (1939) is of birds nesting in *Sterculia* sp., some 40 km south of the town, at Kumide. However, in 1983-4, they were nesting in tall trees near to the town, with nests at least 15 m from the ground. The two records could be considered as separate colonies.

3. Habaswein. At least 100 nests were being used in 1939-40 at Arop Dima (1:00N, 39:30E) and some 30 nests, 50 km to the west, at Goni (1:00N, 30:00E). The second of these is probably the same site as a colony reported from the Lorian Swamp by the Game Department (quoted by Cullen 1955), since when there has been no record. The area is one of the remotest in Kenya, and despite earlier comments on pilots reporting colonies it is quite possible that this one does exist still.

4, 5 and 6. The 'Makindu' group. Kahl (1968) reported a colony of 15 nests, 7 km SW of the town of Makindu, which had grown to some 45-55 nests by 1974 (W.L.N. Tickell, pers. comm., Pomeroy 1979), in two extremely large trees, probably *Acacia gerrardii*. By 1976, this colony had disappeared - possibly as a result of human disturbance - but a new colony had meanwhile appeared at Kiboko, in the grounds of Hunter's Lodge hotel. Over the years, several trees have been used at Kiboko, all *A. tortilis*. In at least one year, Baglafaecht Weavers *Ploceus baglafaecht* nested in one of the Marabou trees, whilst Black-headed Herons nested in an adjacent one.

In 1977, another colony was discovered, at Kibwezi, between the town and the main Nairobi-Mombasa road. This is the eastern extremity of the Kibwezi forest, which is supported by groundwater from the Chyulu Hills. About 20 trees have been used in various years, mainly *A. tortilis* but also some *A. xanthophloea*. These trees extend over a distance of about a kilometre.

7. Central Island, Lake Turkana. Many species of water birds breed on Central Island, or have done so, but so far as is known 1970/71 is the only year when Marabous did so.

TABLE 1

Numbers of Marabou nests at all known colonies in Kenya during the present century. Sources, and the basis for the figures in the final row, are given in the Notes. Breeding takes 6-8 months in Marabous, often extending from one year into the next. The data are given in relation to the year when eggs were laid.

	Colony								
	1. Kitale	2. Garissa	3. Habaswein	Makindu Group			7. Central Is.	8. Wajir	9. Oyugis
				4. Makindu	5. Kiboko	6. Kibwezi			
1935-6		24 ^a							
1939			130 ^b						
1954-5			- ^c						21 ^d
1963	8 ^e								
1964	15 ^e								
1965	18 ^e			15 ^f					
1966	18 ^e								
1970						10-20 ^g			
1972	65								
1974	69			50 ^h					
1975	74								
1976				0	5 ^j				
1977					12	30	- ^{pk}		
1978					14	30			
1979	87				29	70			
1980	95 ^l				19	56			
1981	50 ^l			0	15	59			
1982	38 ^l				9	56			
1983		50 ^m						20 ⁿ	
1979-83 average ^p	67	(50)	(50)	0	18	60	(0)	20	(0)

Notes: a. North 1939; b. North 1943; c. Present: A. Cullen, quoting Kenya Game Archives for 1955; d. L.H. Brown, Nest Record Card, EANHS e. Kahl 1966; f. Kahl 1968; g. M.L. Modha, pers. comm.; h. W.L.N. Tickell, pers. comm.; j. Newsletter 17, August 1977, p.62, Dept. of Ornithology, National Museums of Kenya; k. Newsletter 22, January 1978, Dept. of Ornithology, National Museums of Kenya; l. W. Mokokha and B. Tengecho, pers. comm.; m. Osborn and Alio, 1984; n. G.R. Cunningham-van Someren, pers. comm.; p. Figures for Kitale, Kiboko and Kibwezi are averages for the years shown, for Garissa and Wajir the 1983 figures. The Habaswein colony is considered likely to have

remained extant, since the environment there has not greatly changed, although subject to considerable year-to-year variations. However, a low figure (50) is taken in the absence of any recent record.

Figures not credited are the author's.

8. Wajir. Marabous have been recorded here twice, in two trees in 1977-78, and in five trees in 1983-84, when about 20 nests were in use.

9. Oyugis. Leslie Brown completed a Nest Record Card on which he stated that there were "eggs chipping on 5 November", the site being a small forest patch. The number of nests is not mentioned: possibly it was only one.

10. Molo. Jackson (1938) has only one, intriguing record of Marabous breeding in Kenya: "... in a group of very tall trees on the Molo, close to the crossing on the old caravan road...". There were about 25 nests, one at least containing incubated eggs. It has proved impossible to discover the locality to which Jackson was referring.

In the last row of Table 1, I have attempted to estimate the average number of nests in each colony over the five-year period 1979-1983. The overall total can be no more than a first approximation: especially because the status of the once-large Habaswein colony is quite unknown. However, my estimated total is 265 nests.

SEASONALITY

Marabous show marked seasonal fluctuations in numbers wherever they occur (Pomeroy 1978a): they probably undertake migrations of hundreds of kilometres, or more (Pomeroy 1978b). In Kenya, peak numbers at a site near Nairobi were in March (Pomeroy 1978a). During 1979-80, there was a major roost at Kahawa, 18 km NE of Nairobi, in which numbers increased from about 100 in October to over 1000 for several weeks in January-February, before declining again to low numbers by May (G. Oba, *in litt.*).

Marabou breeding seasons vary geographically (Pomeroy 1978a). In East Africa, egg laying is progressively later in the year as one moves north-westwards. Fig. 1 shows data for the Kiboko-Kibwezi colonies, and for two years at Kitale. These sites provide an interesting contrast. Kibwezi has a mean annual rainfall of about 640 mm (Fenner 1982), whilst that at Kitale is about 1200 mm (Kenya Meteorological Department, *in litt.*). As at most other sites in eastern Africa, breeding in Kenya begins as the wet season is ending, but at Kitale this happens when the rainfall is still about 100 mm a month, whereas at Kibwezi it is practically nil. Thus it seems to be declining rainfall rather than the actual amount of rain, which stimulates breeding at these sites. Both at Kitale and Kiboko-Kibwezi, rainfall remained low for most of the five months when young are in the nest.

I have argued previously (Pomeroy 1978b) that when a rainy season is prolonged, breeding is delayed. Conversely, shorter-than-average

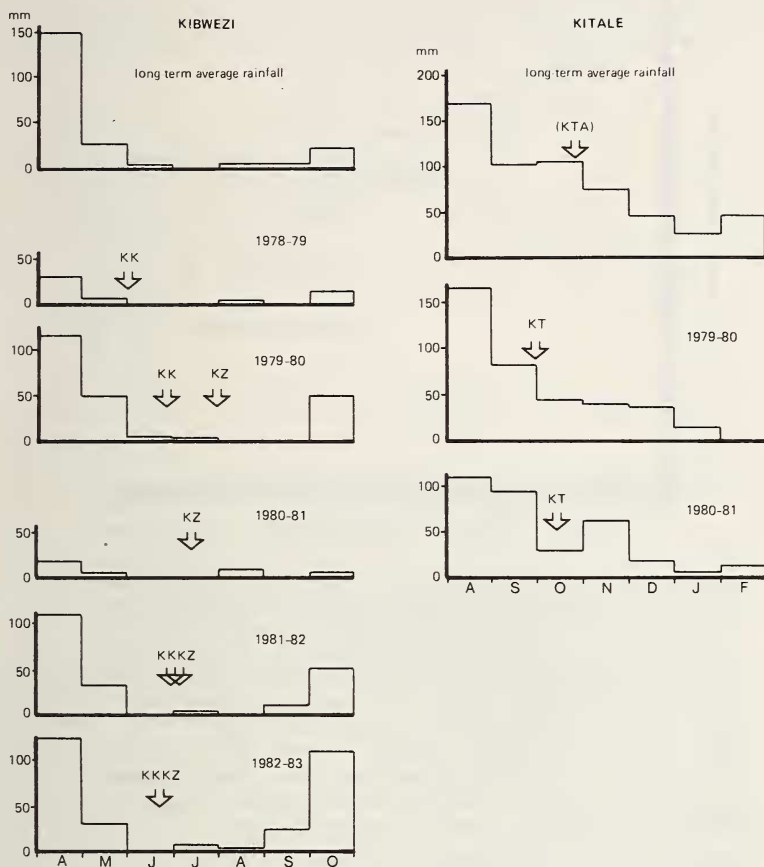


Fig. 1. Mean egg laying dates compared to monthly rainfall. Left: Kiboko (KK) and Kibwezi (KZ) with rainfall for Kibwezi (Fenner 1982). Right: Kitale (KT) with Kitale rainfall; KTA = average egg laying date at Kitale for five previous years (Pomeroy 1978b, Fig. 4), with long-term average rainfall data (courtesy Kenya Meteorological Department).

rains, as seen in 1979-80 and 1980-81 at Kitale, and 1978-79 at Kiboko-Kibwezi, allowed breeding to start sooner. Thus one might also have expected earlier breeding at Kibwezi in 1980-81, when in fact the timing was similar to other, wetter, years. This might suggest that the birds had come to Kibwezi from a higher rainfall area, just prior to breeding. That they do indeed come from else-

where seems certain, because there are very few if any Marabous in the Kibwezi area between January and May.

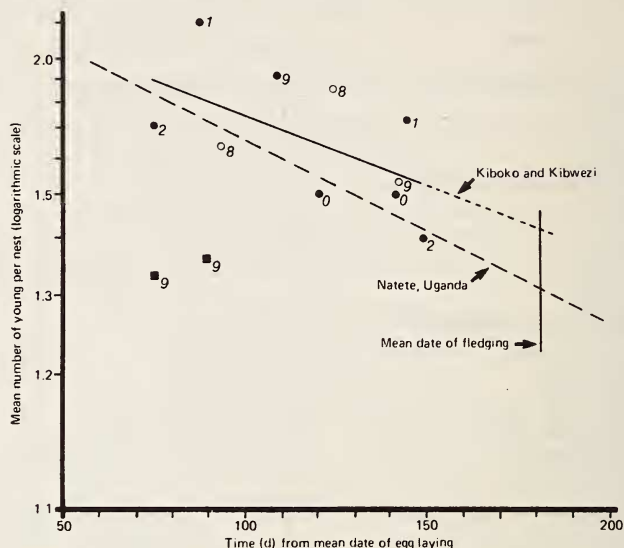


Fig. 2. Numbers of young per surviving nest at Kiboko (O) and Kibwezi (●) (on two occasions in some years) and at various stages of the nestling period: the time scale represents days after the mean date of egg laying. Two observations from Kitale (■) are also shown. The years are: 8 = 78/9, 9 = 79/80, 0 = 80/1, 1 = 81/2, 2 = 82/3. The upper calculated regression (note logarithmic scale on vertical axis) is based upon the data for Kiboko and Kibwezi, and its equation is:

$$\log y = 0.38 - 0.00132x \quad (r = 0.586, P < 0.1)$$

The lower regression, included for comparison, is for Natete, Uganda (Pomeroy 1978c, Fig. 7). The mean date of egg laying is calculated from the appearance of the nestlings, and the average time of fledging is day 182 (Pomeroy 1978c).

BREEDING SUCCESS

From 1978-79 to 1982-83, I made several visits each season to the colonies at Kiboko and Kibwezi, to determine the total numbers of nests and to estimate the average numbers of young produced per nest - that is, the breeding success (Fig. 2). In general, the average numbers of young per nest decline as they get older, because some die in the nest or may even fall out. In Uganda (Pomeroy 1978c) and at

Kitale in Kenya (Kahl 1966), the average number of eggs laid is 2.7 per nest, but as Fig. 2 shows, only about 1.4 young per nest survive to the age of fledging at the Kiboko-Kibwezi colonies; and this figure excludes nests which failed early in the season. Nevertheless one pair at Kiboko reared three young to fledging in 1978-79.

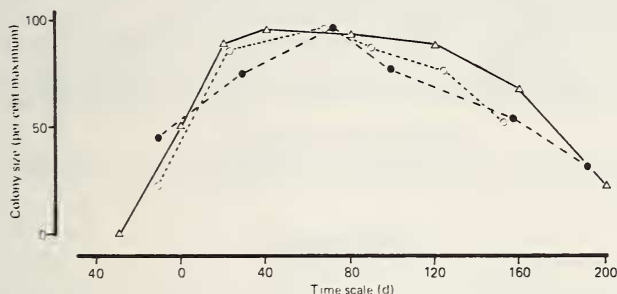


Fig. 3. The total number of nests in use at Kibwezi in 1980-81 (●) and 1981-82 (○) compared to the average for three years at Natete, Uganda (Δ: Pomeroy 1978c, Fig. 1(a)). The vertical scale shows the number of nests on a particular day compared to the total built, whilst the time scale is days from the mean egg laying date, as in Fig. 2.

The overall breeding success of the Kiboko-Kibwezi colonies is less than that implied by Fig. 2. This is because some nests fail completely. The proportion that do so can only be determined by frequent visits, as was done at Natete, Uganda (Fig. 3). Here, the overall success in three consecutive years was 0.7, 1.2 and 0.9 young per nest, an average of 0.9 for the colony as a whole. At Kiboko-Kibwezi, the numbers of nestlings per surviving nest were greater than at Natete (Fig. 2), yet more nests seem to have failed (Fig. 3). It is therefore likely that an overall figure of about 0.9 young per nest could be applied to Kiboko and Kibwezi too.

Breeding success at Kitale in 1979-80 and 1980-81 was significantly lower than for the other two Kenya colonies shown in Fig. 2. This may have contributed to the rapid decline in that colony in the following two years (see Table 1).

DISCUSSION

Marabous are gregarious, but away from their few breeding colonies their numbers in Kenya are quite low, rarely exceeding 50 at any one place. This contrasts with Uganda, where several hundreds were regularly seen at some fishing villages (Pomeroy 1973, 1977b). In Kenya, the largest numbers appear at roosts, as mentioned earlier: even in July, over 200 were recorded at one roost near Athi River (Evans *et al.* 1973).

The total Kenya breeding population is probably less than 300 pairs, whereas in Uganda more than 2000 were recorded in the 1970s (Pomeroy 1977a). Despite the very large numbers roosting at one site in Nairobi in 1979-80, the total population of this species in Kenya seems unlikely to be more than 1000-2000, with the highest numbers between December and March.

If one compares the numbers of pairs breeding at the only three colonies for which there are annual records from 1979 to 1982 (Table 1), the average number of nests at these colonies in 1979 and 1980 was 178; but in 1981 and 1982 it was 84.5, a decline of more than 50 per cent. The Marabou population in Kenya is apparently not stable, and further studies are likely to prove interesting.

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REFERENCES

- CULLEN, A. 1955. *Window onto wilderness*.
- EVANS, S.M., CANTRELL, M.A. & CRAM, A. (Eds.) 1973. Report of the University of Newcastle upon Tyne Exploration Society's Expedition to Kenya 1972. Mimeo report.
- FENNER, M. 1982. Features of the rainfall at Kibwezi, Kenya. *East African Agriculture and Forestry Journal* 45: 83-91.
- KAHL, M.P. 1966. A contribution to the ecology and reproductive biology of the Marabou Stork (*Leptoptilos crumeniferus*) in East Africa. *Journal of Zoology, London* 148: 289-311.
- 1968. Recent breeding records of storks in Eastern Africa. *Journal of the East Africa Natural History Society and National Museum* 27 (116): 67-72.
- LEWIS, A.D. & POMEROY, D.E. In press. *A bird atlas for Kenya*. Rotterdam: Balkema.
- NORTH, M.E.W. 1939. Field notes on certain raptorial and water birds in Kenya Colony. *Ibis* 81: 487-507.
- 1943. The breeding of the Marabou Stork in East Africa. *Ibis* 85: 190-198.
- OSBORN, R.M. & ALIO, A.M. 1984. A birdwatching safari in the North East Province, Part II. *EAHNS Bulletin* 1984: 88-96.
- POMEROY, D.E. 1973. The distribution and abundance of marabou storks in Uganda. *East African Wildlife Journal* 2: 227-240.
- 1977a. Marabou Stork *Leptoptilos crumeniferus* breeding colonies in Uganda. *Journal of the East Africa Natural History Society and National Museum* 31 (161): 1-11.
- 1977b. The biology of Marabou Storks in Uganda. I. Some general characteristics of the species, and the population structure. *Ardea* 65: 1-24.

POMEROY, D.E. 1978a. Counts of Marabou Storks *Leptoptilos crumeniferus* in relation to their movements in eastern Africa. *Scopus* 2: 92-96.

_____ 1978b. Seasonality of Marabou Storks *Leptoptilos crumeniferus* in eastern Africa. *Ibis* 120: 213-321.

_____ 1978c. The biology of Marabou Storks in Uganda. II. Breeding biology and general review. *Ardea* 66: 1-23.

_____ 1979. Nesting of Marabou Storks in the Makindu-Kiboko-Kibwezi area. *EANHS Bulletin* 1979: 114-116.

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REQUEST FOR INFORMATION

THREATS TO THE WHITE STORK ON MIGRATION

In January 1986, WWF-Germany and ICBP started a joint project to investigate the threats to the White Stork *Ciconia ciconia* on its migration routes and in its wintering areas. Major aims of the project are:

- to analyse factors threatening the White Stork directly and indirectly in the different countries on its migration routes
- to analyse the extent of application of biocides and their direct and indirect effects on migrating White Storks
- to draw together a list of areas which are of major importance for migrating White Storks
- to produce comprehensive documentation containing results of the project and suggestions for an international conservation strategy for the species

Collaborators are needed who can submit information and observations from southern Europe, the Middle East and Africa. People interested in co-operating should contact the project leader as soon as possible for further details:

WWF-Germany/ICBP White Stork Project, Dr Holger Schulz, Am Lindenberg 1 D-3331 LELM, Federal Republic of Germany [tel: 05353/8005]